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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/612,287	07/03/2003	Horst Corduan	LINDE-597 P1	5770

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EXAMINER	
LEUNG, RICHARD L	

ART UNIT	PAPER NUMBER
3744	

DATE MAILED: 07/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

SP

Office Action Summary	Application No.	Applicant(s)	
	10/612,287	CORDUAN ET AL.	
	Examiner	Art Unit	
	Richard L. Leung	3744	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 May 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *17* is/are allowed.

6)☒ Claim(s) *1-16,19 and 20* is/are rejected.

7)☒ Claim(s) *18* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 May 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

Drawings

2. The drawings were received on 31 May 2005. These drawings are acceptable.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-5, 9, 11, and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by US 5755280 (da Costa et al.). Referring particularly to Fig. 1, da Costa et al. disclose a plate heat exchanger for the indirect heat exchange between at least one heat transfer medium/cooling medium A and a plurality of fluid flows B-D comprising a heat exchange core (plate bundle) 3 having a plurality of heat exchange passages for flow of at least one heat transfer medium/cooling medium A, flow of a first fluid C, and flow of a second fluid D, said heat exchanger core 3 having a first component area (plate sub-bundle) 3b containing heat exchange passages for the first fluid flow C and a second component area (plate sub-bundle) 3c containing heat exchange passages for the second fluid flow D, wherein said first and second component areas 3b and 3c are not in fluid communication, said first and second component areas 3b and 3c each extending over the height of the heat exchanger core

3, said passages of said first and second component areas 3b and 3c are rectilinear over the height of said heat exchanger core 3, and each of said first and second component areas 3b and 3c extending over only part of the width of the heat exchanger core 3. Said heat exchanger core 3 has a plurality of separating plates 5 arranged parallel to one another, wherein the spaces between adjacent pairs of plates contain said heat exchange passages for the heat transfer/cooling medium A, the first fluid flow C, and the second fluid flow D (column 3, lines 23-34), wherein said first and second component areas 3b and 3c each extend over the depth of the heat exchanger core 3, and wherein said heat exchange passages for the flow of heat transfer medium/cooling medium A extend uniformly over the entire width of the heat exchanger core 3 (Figs. 1 and 2). Said first component area 3b communicates with a single distributor and collector 1b that traverse the depth of the heat exchanger core 3 (Figs. 1 and 2), and said heat exchanger core 3 is subdivided along its width by separating sheets 4 to form said first and second component areas 3b and 3c.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 6-8 and 20 rejected under 35 U.S.C. 103(a) as being unpatentable over US 5755280 (da Costa et al.). As discussed above regarding claims 1-5, the example discussed by da Costa et al. disclose all the limitations of the claims except for

expressly demonstrating a third component area which is not in fluid communication with said first and second component areas 3b and 3c and which extends over the entire height of said heat exchanger core 3, said third component area containing heat exchange passages for flow of a third fluid flow that are rectilinear over the height of said heat exchanger core 3, said third component area extending over only part of the width of the heat exchanger core 3. It should be noted, however, that da Costa et al. do suggest that additional fluid flows could be included, indicating that the heat transfer medium/cooling medium A can be heat exchanged with "N" number of transversely circulating fluids (column 2, lines 62-67) and that the example discussed is only one embodiment showing three fluids. Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided a third component area for a third fluid flow in the heat exchanger because the additional fluid flow would allow for greater heat transfer, which may be necessary depending upon the exact application. Understandably, said third component area would be constructed in the same manner as said first and second component areas 3b and 3c and be likewise separated from the other components.

7. Claims 10-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art, as disclosed by figures 1-4 and the present specification in view of US 5755280 (da Costa et al.). The admitted prior art discloses a process for the indirect heat exchange of several fluid flows 30, 40, and 50 with a heat transfer medium/cooling medium 10 and 20 in a heat exchanger core 9, particularly a process for cryogenic air-separation comprising separating air 10 into an oxygen product stream

7 and a nitrogen product stream 8 in an air rectification system having a heat exchanger 1 for cooling feed air 10, comprising routing the heat transfer medium/cooling medium 10 and 20, a first fluid flow 40 and a second fluid flow 30 through a plurality of heat exchange passages. Said first fluid flow 40 is routed through a first component area 48 of the heat exchanger core 9 and said second fluid flow 30 is routed through a second component area 38 of the heat exchanger core 9, said first and second component areas 48 and 38 are not in fluid communication and each extends over the entire height of the heat exchanger core 9. It is disclosed that said first and second fluid flows 40 and 30 are obtained by cryogenic separation of feed air (page 11, lines 18-20) and are brought into indirect heat exchange with air (page 12, lines 1-2). It is further disclosed that said fluid flows 40 and 30 have a pressure of roughly 1.3 bar (page 11, lines 18-20) and that an additional fluid flow 60 is routed through said heat exchanger core 9 having a pressure of more than 5 bar (page 13, lines 20-21 and Fig. 4). The admitted prior art fails to disclose that the flow through said passages of the first and second component areas 48 and 38 is rectilinear over the height of said heat exchanger core 9, or that each of said first and second component areas extend over only part of the width of the heat exchanger core 9. As already discussed above, da Costa et al. teach a plate heat exchanger for the indirect heat exchange between at least one heat transfer medium/cooling medium A and a plurality of fluid flows B-D comprising a heat exchange core (plate bundle) 3 having a plurality of heat exchange passages for flow of at least one heat transfer medium/cooling medium A, flow of a first fluid C, and flow of a second fluid D, said heat exchanger core 3 having a first component area (plate sub-bundle) 3b

containing heat exchange passages for the first fluid flow C and a second component area (plate sub-bundle) 3c containing heat exchange passages for the second fluid flow D, wherein said first and second component areas 3b and 3c are not in fluid communication, said first and second component areas 3b and 3c each extending over the height of the heat exchanger core 3, said passages of said first and second component areas 3b and 3c are rectilinear over the height of said heat exchanger core 3, and each of said first and second component areas 3b and 3c extending over only part of the width of the heat exchanger core 3. It would have been obvious to one of ordinary skill in the art to have modified the heat exchanger in the admitted prior art air separation process such that said first and second component areas are rectilinear over the height of said heat exchanger core and extend over only part of the width of the heat exchanger core because da Costa et al. explicitly teach that a heat exchanger of this arrangement has the advantages of being more compact, being simpler in construction, and having less fluid head loss (column 1, lines 54-60).

Allowable Subject Matter

8. Claim 17 is allowed.

9. Claim 18 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

10. Applicants' arguments with respect to claims 1-16, 19 and 20 have been considered but are not persuasive in view of the new grounds of rejection. This Office

Action is being made non-final to afford the Applicants an opportunity to respond to the new grounds of rejections.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard L. Leung whose telephone number is 571-272-4811. The examiner can normally be reached on Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl J. Tyler can be reached on 571-272-4834. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Richard L. Leung
Examiner
Art Unit 3744

CHERYL TYLER
SUPERVISORY PATENT EXAMIN

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